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Scotopteryx kurmanjiana, a new species from the Kopet-Dagh Mountains (Lepidoptera, Geometridae, Larentiinae)

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Abstract. *Scotopteryx kurmanjiana* sp. n. is described from the Kopet-Dagh Mountains in Northeast Iran and South Turkmenistan. The new species is considered to be closely related to *Scotopteryx kuznetzovi* (Wardikian, 1957) described from Armenia. Detailed description of the external morphology and the genitalia characters of the male with six colour photographs and two illustrations of genitalia are provided.

Introduction

Scotopteryx Hübner, 1825, is a widely distributed genus occurring from North Africa throughout Europe to the Pacific East Asia, South Africa and Southern America (Parsons et al. 1999; Scoble and Hausmann 2007). Traditionally it belongs to the tribe Xanthorhoini of the subfamily Larentiinae (Pierce 1914), but recently it was placed again into the tribe Scotopterygini Warren, 1895 (Viidalepp 2011; Schmidt 2013). The genus is one of the species-richest larentiine clades, as more than 70 species are known worldwide (Scoble & Hausmann 2007).

In the course of a recent taxonomic revision of the subfamily Larentiinae (Rajaei Sh. 2012) and after re-describing and publishing the new records of the poorly known *Scotopteryx kuznetzovi* (Wardikian, 1957) (Rajaei Sh. and Stüning 2012), two peculiar *Scotopteryx kuznetzovi*-like specimens have been discovered in the Zoological State Collection of Bavarian State and the private collection of Gyula M. László, collected in the Iranian and Turkmenian sides of the Kopet-Dagh Mountains. Although these two specimens are undeniably closely related to *S. kuznetzovi*, their wing pattern and the genitalic characters show remarkable differences in comparison to those of *S. kuznetzovi*. In addition, the Kopet-Dagh, where the two specimens were collected, is about 1000 km from the known range of *S. kuznetzovi*, which is distributed in South Armenia, West Iran and East Turkey, supporting the taxonomic separation of the examined specimens. These observations led the authors to a description of a new species *Scotopteryx kurmanjiana* sp. n. from the specimens from the Kopet-Dagh Mts as a potential sister species of *S. kuznetzovi*.

Methods

Genitalia of the examined specimens were dissected following standard procedures (Robinson 1976). Permanent genitalia slides were studied and photographed with a digital stereo-microscope (ZEISS-SteREO: Discovery.V20) in ZFMK. The specimens examined in this study are deposited in the following collections (acronyms after Evenhuis and Samuelson 2007): ZFMK – Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany; ZSM – Zoologische Staatssammlung München, Germany; HMIM – Hayk Mirzayans Insect Museum, Tehran, Iran; LG – number of genitalia slide made by Gy. M. László.

Scotopteryx kuznetzovi (Wardikian, 1957)

Figs 3, 4, 6

Material. Iran: 2 ♂: Basmendj [NW Iran, SE Tabriz], 15.x. [19]74, [leg.] Damanabi, gen. preps slide Nos: 1063 & 1064/2010 H. Rajaei (coll. HMIM). 3 ♂, Prov. Azerbayejan, E-Garbi, 11 km S of Shoet, 1350m, 31.x-01.xi.2003, leg. P. Gyulai & A. Garai, slide No.: LG 2834; 1 ♂, Prov. Esfahan, 2750m, C-Zagros, Golestan Khuh, 10 km S of Khansar, 10-11.x.2001, leg. P. Gyulai & A. Garai, slide No.: LG 2339; 10 ♂, same data, but collected at 27-28.x.2003; 1 ♂, Prov. Esfahan, 7 km NW of Natanz, (to Kashan), Kuh-e-Karkas, 1500m, 18-19.x.2003, leg. P. Gyulai & A. Garai; 5 ♂, Prov. Esfahan, C-Zagros, 2600m, 2 km NE of Semirom, 20-21.x.2003, leg. P. Gyulai & A. Garai, slide Nos: LG 2832, 2833 (coll. Gy. M. László). **Turkey**: 2 ♂, Ost Türkei, Van, 2700 m, Güzeldere Pass, 28.ix.1981, leg. P. Kuhna, gen. prep. slide No.: 3074, P. Kuhna; 1 ♂: Prov. Bitlis, Van Gölü, 19 km E of Ahlat, 1700 m, 42°34‘ E, 38°46‘ N, 18.x.1993, leg. Gy. Fábián, B. Herczig, Gy. László and K. Szeőke, (coll. ZFMK). 4 ♂, Prov. Bitlis, Van Gölü, 19 km E of Ahlat, 1700 m, 42°34’ E, 38°46’ N, 18.x.1993, leg. Gy. Fábián, B. Herczig, Gy. László and K. Szeőke, slide No. 394 Gy. M. László; 1 ♂, Prov. Dogubayazit, Ishak Pasha Serayi near Dogubayazit, 14–15.x.2003, leg. P. Gyulai & A. Garai (coll. Gy. M. László).

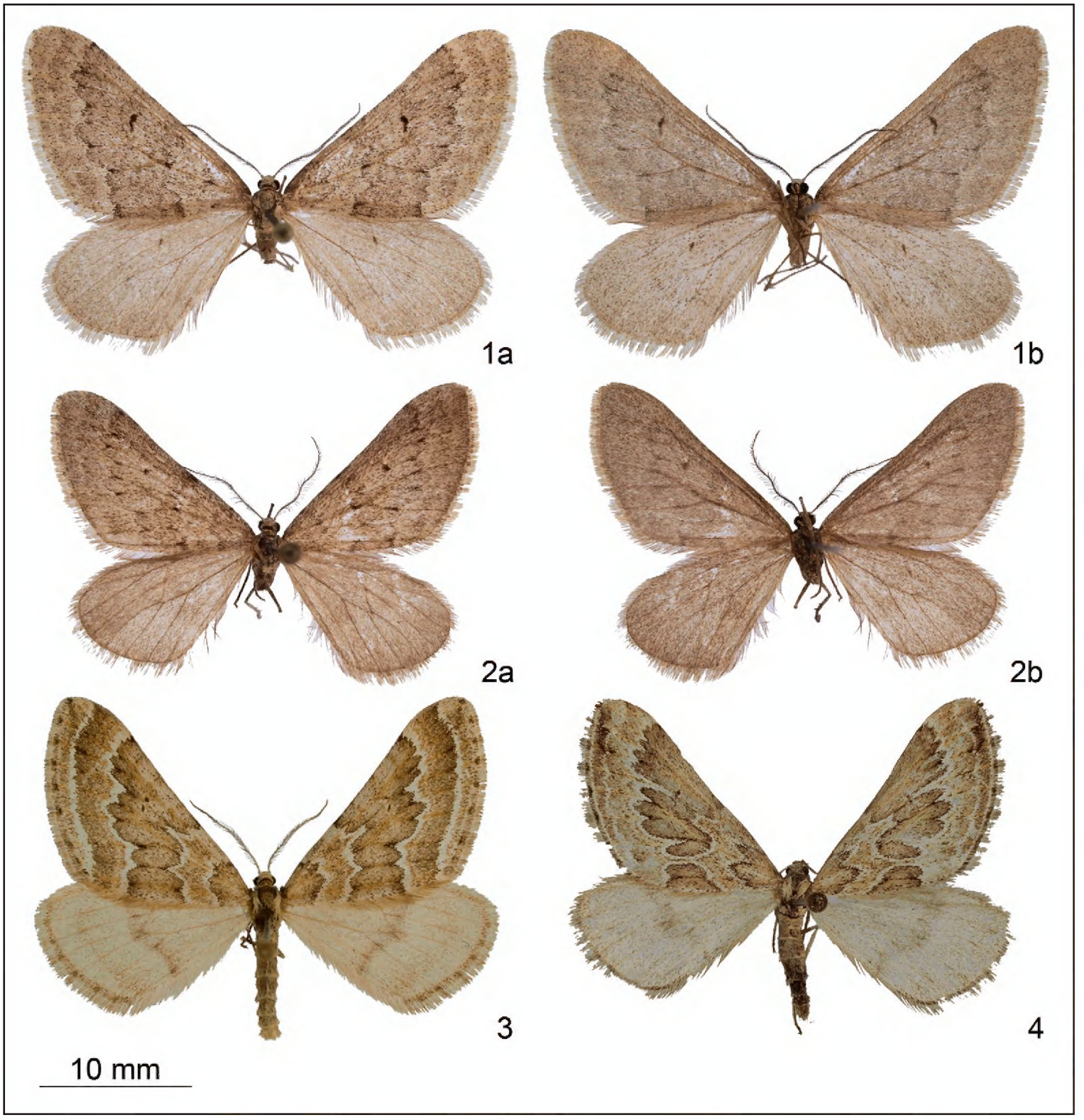
Remarks. A large series of *Scotopteryx kuznetzovi* specimens was examined in order to determine the individual variability of morphological characters within this species. As a supplementary result of this survey, *S. kuznetzovi* has been recorded from several new localities, extending our knowledge of its distribution.

Scotopteryx kurmanjiana sp. n.

http://zoobank.org/ACDC8372-F2A6-445A-BCFF-B555558076E1
Figs 1, 2, 5

Material. Holotype ♂, **Turkmenistan,** SW Kopetdagh, Garrygala env. 1994.xi.15-30, Leg. Miatleuski J., slide No.: LG 1747 (ZSM). Paratype**:** 1 ♂, **Iran**, Prov. Khorasan, Kopet-Dagh Mts, 80 km NE of Qucan [Quchan], 1900 m, 37°28‘ N, 58°34‘ E, 30.x.2000, leg. B. Benedek & Gy. Fábián, slide No. LG 1746 (coll. Gy. M. László).

Description. (Figs 1, 2). Male: Wingspan 28–33 mm (Length of forewing: 16–18 mm). Antenna bipectinate from base to tip, except 2–3 distal segments, rami moderately long, black, dorsally unscaled, arising ventrally from the proximal end of the flagellum segments. Head, thorax and abdomen covered with mixed brown-white scales. Frons broad, slightly protruding, lower part smoothly covered with very small dark brown scales, upper margin covered with mix of whitish and pale brown scales; vertex with large white and pale brown scales. Chaeto-

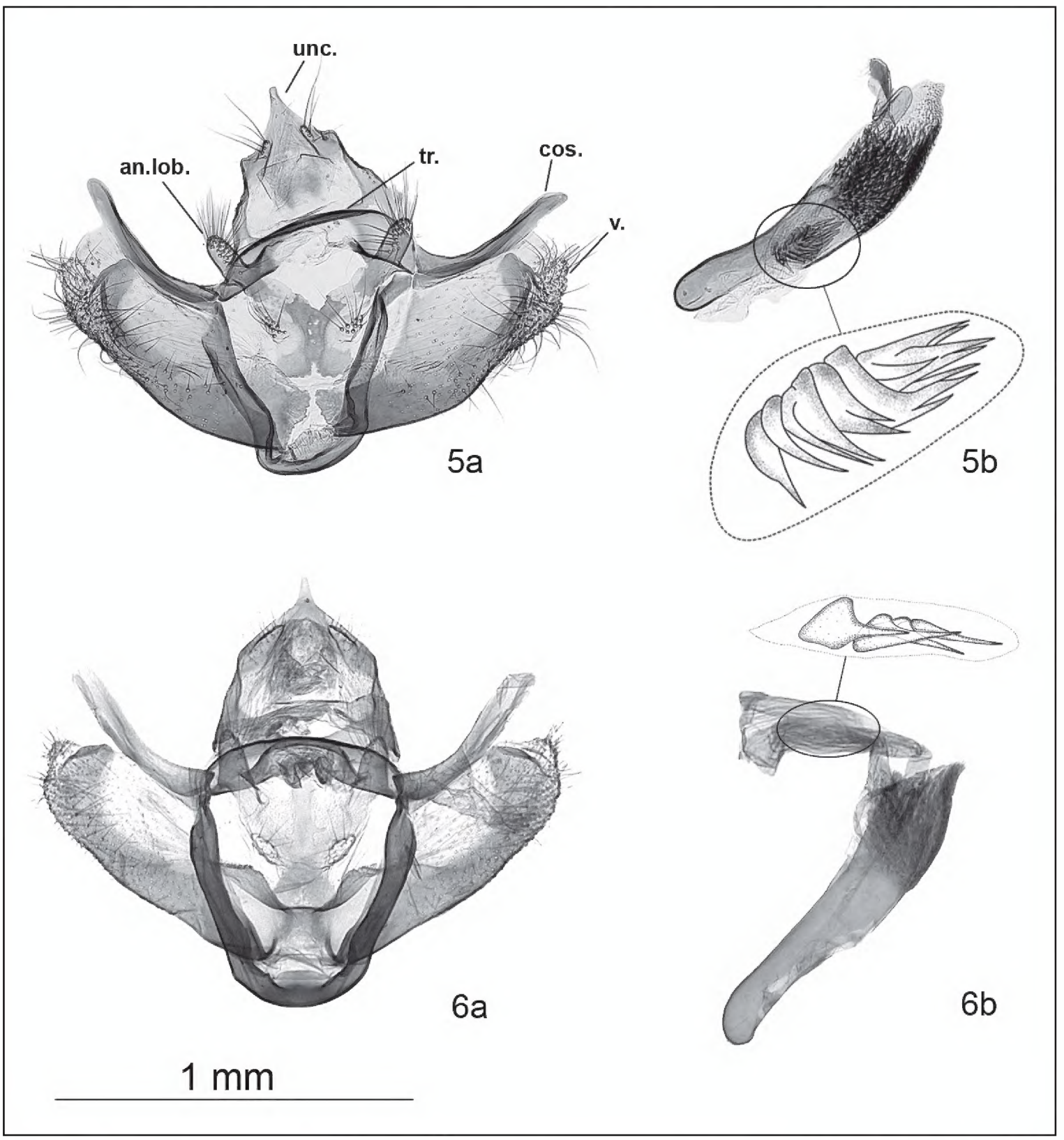


Figures 1–4. Wing pattern of adults (males). 1-2: *Scotopteryx kurmanjiana* sp. n. 1. Holotype; NE Quchan, Iran; 2. Paratype; Garrygala, S Turkmenistan; 3-4: S. kuznetzovi. 3. Guzeldere Pass, E. Turkey; 4. Basmendj, NW Iran; a: dorsal view, b: ventral view.

semata transversally extended. Palpi short and narrow, acute at tip, just reaching beyond the clypeus. Haustellum almost completely reduced. Index of spurs: 0-2-4. Forewings elongated, apex and tornus rounded; apical patch absent; ground colour pale greyish-brown; basal area and medial band slightly darker, edged with dark brown. Basal line indented. Antemedial line roundly curved in the middle, with two moderately acute incisions. Medial line shadow-like, poorly visible, median area uniformly pale greyish-brown, discal spot small, blackish, sharply defined. Postmedial line wavy, roundly curved outwards in the middle. Submarginal line blurred, poorly visible. Hindwings oval, elongated, cream-brown, crossline absent, discal spot very small, poorly visible. Fringes in both wings unicolorous and consisting of a row of shorter and darker basal scales and a row of longer and lighter terminal scales. Underside pale greyish

brown, generally paler than upperside, basal area and middle band darker, patterns of upper side partly visible. Underside of the hindwing even paler than that of the forewing. Abdomen long, narrow, light grey. Coremata absent.

Male genitalia (Fig. 5). Vinculum rather short and broad, gently rounded. Valva short, broad at the base, sacculus well sclerotized, slightly arched, having conspicuous, trapezoidal apical lobe. Distal margin of valva broadly rounded, setose; costal margin strongly sclerotized, slightly arcuate, with an apically rounded, finger-like apical process surpassing the distal edge of valva. Transtilla present, curved, band-like. Uncus broad at base, triangular with narrow, acute tip, curved ventrad. Anellus lobes conically elongated, distally rounded, setose. Juxta X-shaped.



Figures 5–6. Male genitalia. 5. *Scotopteryx kurmanjiana* sp. n., Holotype (Slide No.: LG 1747 M; S Turkmenistan); 6. *S. kuznetzovi* (Slide No.: 1063 H. Rajaei; NW Iran); a: genital armature, b: phallus. Abbreviations: an.lob. Anellus lobe; cos. Costa; tr. Transtilla; unc. Uncus; v. Valva.

Phallus tubular, slightly longer than valva, gently curved, distal half covered with the densely spined part of manica, apically with a well-developed finger-like process of carina; vesica bears a bunch (over 10) of broad-based, strongly sclerotized cornuti.

Female. Unknown.

Diagnosis (Figs 1–6). According to its morphological and genital features, *Scotopteryx kurmanjiana* appears to be closely related to *S. kuznetzovi* but is nevertheless easily distinguishable by several characters (for the distinctive features between *S. kuznetzovi* and other related *Scotopteryx* species see Rajaei Sh. and Stüning 2012). External features: the new species has less protruded frons in comparison with *S. kuznetzovi* and in general less shiny wing surface; the transverse lines are much less sharply defined, lacking the white highlight, which is very characteristic in *S. kuznetzovi*; the median area is much paler, less contrasting in *S. kurmanjiana*; the submarginal line is inconspicuous, more or less shadow-like, whereas it is sharply defined with whitish scales in *S. kuznetzovi*; the discal spots are present in both wings while these are absent in the hindwings of *S. kuznetzovi*. The apical patch of *S. kurmanjiana* is indistinct while a whitish triangular patch is present in *S. kuznetzovi*; the fringes are uniformly whitish-grey, while they are chequered with dark brown in *S. kuznetzovi*. Finally, the hindwing of *S. kurmanjiana* is unicolorous, without transverse line or band, while a well-defined dark-grey medial band is present in *S. kuznetzovi*.

The specific differences between the two species are well expressed in genitalia (see the Figs 5a and 6a): the new species has shorter and smaller apical lobe of sacculus, more sclerotized, much thinner costal margin of valva with conspicuously shorter and apically more tapering costal process, broader base of uncus, somewhat more strongly sclerotized and differently shaped juxta. The distal half of the phallus of the new species is covered with densely spined part of manica, while the spinose part of manica is only one third of the length of the phallus in *S. kuznetzovi*. Finally, the vesica of *S. kurmanjiana* is armed by more than 10 well-sclerotized cornuti, while the number of cornuti in *S. kuznetzovi* is fewer than five.

Bionomy. The known specimens of *S. kurmanjiana* were collected in the late autumn, similarly to *S. kuznetzovi*. The foodplant and the early stages are unknown.

Distribution. The species is known to occur on both sides of Kopet-Dagh Mountains in NE Iran and S Turkmenistan.

Etymology. The name of the species is dedicated to the Kurmanj people in northeastern Iran. This Kurdish tribe migrated from Kurdistan and settled in Khorasan-e Shomali, mainly in Quchan, Shirvan and Bojnurd.

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